In Fig. 1, the basic layout of a tdr fill level sensor with improved security against interference is shown schematically, as an example of an application of the invention. The key part of the sensor is a waveguide 4, whose upper end forms the process terminal 18 and for instance is a retaining part 18; the waveguide 4 protrudes into a container 12 and dips partway into a medium 13 contained therein which forms a surface 14 and hence a boundary layer 14. A trigger generator 1 is used to generate a transmission trigger signal X_{TS} at the pulse repetition frequency f_{prf} and a scanning trigger signal X_{TA} at the scanning frequency f_A. The trigger generator 1 is controlled by a control unit 8. Examples of the detailed embodiment of the trigger generator 1 are shown in Figs. 4-6 and explained--

IN THE CLAIMS:

Please cancel claims 1-16 without prejudice or disclaimer of the subject matter thereof.

Please add the following new claims:

17. A method for increasing the interference resistance of a time domain reflectometer, comprising the steps of:

generating a transmission pulse at a pulse repetition frequency;

coupling said transmission pulse into a waveguide;

scanning a reflected signal which is reflected back by a reflector in contact with the waveguide, for time-expanded display as a reflection profile with scanning pulses repeated at a scanning frequency;

continuously obtaining measured values, from said reflection profiles, that contain the distance of the reflector to a process terminal; and

using an algorithm for deciding the usability of said measured values, which from said measured values and the amount of interference calculates whether said reflection profile is sufficiently free of interference that adequate measurement accuracy is achieved, wherein:

said scanning frequency and said pulse repetition frequency are varied;

one of the following conditions apply: the time-expanded display of said reflection profiles remains unchanged, and if said reflection profiles change over time, the change in the time expansion is known and is taken into account in the evaluation of the profiles; and

the amount of interference is determined from at least one measurement of said reflected profiles or a part thereof.

18. The method as defined in claim 17, wherein the algorithm comprises the following steps:

varying said scanning frequency and said pulse repetition frequency, if the amount of interference exceeds a predetermined threshold;

subsequent to said varying step, determining and assessing again the amount of interference; and

repeating said varying step and said subsequent determining and assessing step until the amount of interference is below said predetermined threshold.

19. The method as defined in claim 18, further comprising the step of:

providing a predetermined table which contains suitable frequencies used for determining the variation in said scanning frequency and said pulse repetition frequency, wherein access to said predetermined table is one of: linear and random.

20. The method as defined in claim 19, further comprising the step of:

selecting said scanning frequency and said pulse repetition frequency from a frequency range for the purpose of changing said scanning frequency and said pulse repetition frequency.

21. The method as defined in claim 17, wherein said pulse repetition frequency is varied by means of one of: a voltage controlled oscillator and a numerically controlled oscillator.

22. The method as defined in claim 21, further comprising the steps of:

providing a controllable delay circuit supplied with a reference signal at said pulse repetition frequency, and generating an output signal;

determining the delay in said output signal by a predetermined set-point delay value, with which the controllable delay circuit is controlled; and

obtaining a scanning trigger signal from a transmission trigger signal by means of the controllable delay circuit.

23. The method as defined in claim 17, wherein the amount of interference is obtained by a comparison of the pulse associated with said reflected profiles with a predetermined reference pulse.

24. The method as defined in claim 17, wherein the amount of interference is obtained by one of: the difference between the maximum and minimum deviation in said reflection profiles from a predetermined value, and the difference between the maximum and minimum deviation from a reference profile in a predetermined time slot or spacing slot.

25. The method as defined in claim 17, wherein the frequency and/or phase of said scanning pulses, upon a variation in said pulse repetition frequency, is adapted such that the difference between said scanning frequency and said pulse repetition frequency does not exceed a predetermined range or is constant .

26. A method for increasing the interference resistance of a time domain reflectometer, comprising the steps of:

generating a transmission pulse at a pulse repetition frequency;

coupling said transmission pulse into a waveguide;

scanning a reflected signal which is reflected back by a reflector in contact with the waveguide, for time-expanded display as a reflection profile with scanning pulses repeated at a scanning frequency;

continuously obtaining measured values, from said reflection profiles, that contain the distance of the reflector to a process terminal; and

using an algorithm for deciding the usability of said measured values, said algorithm comprising:

varying said scanning frequency and said pulse repetition frequency;

applying one of the following conditions: the time-expanded display of said reflection profiles remains unchanged, and if said reflection profiles change over time, the change in the time expansion is known and is taken into account in the evaluation of the profiles;

determining the amount of interference and obtaining the measured value from the measurement of said reflected profiles or a part thereof; and

checking the usability of the measured value by evaluating the amount of interference, and continuing with the variance step.

27. The method as defined in claim 26, wherein the algorithm comprises the following further steps:

executing the steps of claim 26 multiple times; and

selecting the most likely measured value from the measured values

determined in said multiple executing step and using that value.

28. A circuit arrangement for increasing the interference resistance of a time domain reflectometer, comprising:

a trigger generator for generating a transmission trigger signal with a variable pulse repetition frequency that is variable by a control signal, and a scanning trigger signal with a frequency and/or phase difference from said transmission trigger signal;

a scanning generator for generating transmitting and scanning pulses, respectively caused by said transmitting and said scanning trigger signal;

a scanning unit capable of scanning said transmission pulses which are returned from a waveguide for time--expanding display as a reflection profile; and

a control unit for evaluating said reflection profile and generating said control signal which adjusts the phase or frequency difference between said trigger signals, and with which said trigger generator is made to vary said variable pulse repetition frequency.

29. The circuit arrangement as defined in claim 28, wherein said trigger generator includes a controlled oscillator which is controlled by one of: voltage and numerical, and which oscillates at said pulse repetition frequency.

30. The circuit arrangement as defined in claim 29, wherein said trigger generator includes a controllable delay circuit which is subjected to the output signal of said controlled oscillator, and whose output signal represents said scanning trigger signal.

31. The circuit arrangement as defined in claim 29, further comprising:

a regulator, and wherein said trigger generator further includes a further controlled oscillator which oscillates at said scanning frequency, and optionally the difference in frequencies of the oscillations of both controlled oscillators is set to a predetermined value by said